WHAT IS CLAIMED IS:

1. A semiconductor device comprising:

a package board formed of a wiring board, in which at least one of a plurality of through-hole wires and a plurality of via-hole wires are formed in the wiring board, the plurality of through-hole wires and the plurality of via-hole wires electrically connect an upper surface to a back surface of the wiring board, pads are formed on the upper side of the wiring board, and the pads are connected to the through-hole wires or the via-hole wires;

a semiconductor chip, in which a plurality of pads including power supply pads are formed on a device-forming surface of the semiconductor chip, bumps are formed on the plurality of pads, a plurality of through-hole wires are formed in the semiconductor chip, the plurality of through-hole wires electrically connect the device-forming surface side to a back surface side of the semiconductor chip, at least some of the power supply pads are connected to the plurality of through-hole wires, a plurality of pads are formed on the back surface and connected to the through-hole wires, bumps are formed on the pads formed on the back surface, and the semiconductor chip is flipchip-connected to the package board in a manner that the bumps on the device-forming surface of the semiconductor chip are provided opposite to the pads on the

upper surface of the package board;

a capacitor-mounted board formed of an organic substrate or a ceramic substrate, in which through-hole wires are formed in the capacitor-mounted board, the through-hole wires electrically connect an upper surface to a back surface of the capacitor-mounted board, capacitors are mounted on the capacitor-mounted board in a manner that electrodes of the capacitors are connected to printed wires connected to the through-hole wires, pads connected to the through-hole wires are formed on a back surface and connected to the through-hole wires, and the capacitor-mounted board is flipchip-connected to the semiconductor chip in a manner that the pads on the capacitor-mounted board are provided opposite to the bumps on the back surface of the semiconductor chip;

an adhesive resin filled between the semiconductor chip and the package substrate and between the semiconductor chip and the capacitor-mounting board, the adhesive resin adhering the semiconductor chip to the package substrate and the semiconductor chip to the capacitor-mounting board;

a resin package formed on the package substrate, the resin package being formed of molding resin and covering a sidewall of the semiconductor chip, a sidewall of the capacitor-mounting board and upper surfaces of the capacitors; and

a ball grid array comprising a plurality of external terminal balls formed on the back surface of the package substrate, the plurality of external terminal balls being connected to said one of the plurality of the through-hole wires and the plurality of the via-wires on the back surface of the package substrate.

2. A semiconductor device according to claim 1, wherein the semiconductor device further comprises a heat spreader mounted on a predetermined region of the upper surface of the capacitor-mounting board via a thermal paste.

3. A semiconductor device according to claim 2, wherein the heat spreader is mounted on a central region of the upper surface of the capacitor-mounting board and the capacitors are mounted on the upper surface of the capacitor-mounting board to surround the periphery of the heat spreader.

4. A semiconductor device according to claim 1, wherein sizes of the semiconductor chip and the capacitor-mounting board are smaller than a size of the package board, and a sidewall of the mold resin covering sidewalls of the semiconductor chip and the capacitor-mounting board is substantially aligned with a side wall of the package board.

5. A method of assembling a semiconductor device comprising:

forming a semiconductor chip, in which a plurality of pads including power supply pads are formed on a device-forming surface of the semiconductor chip, a plurality of through-hole wires are formed in the semiconductor chip, the plurality of through-hole wires extend from the device-forming surface to a back surface of the semiconductor chip, at least some of the power supply pads are connected to the plurality of through-hole wires, a plurality of pads are formed on the back surface and connected to the through-hole wires, first solder bumps are formed on the pads formed on the back surface;

forming a package board formed of a wiring board, in which at least one of a plurality of through-hole wires and a plurality of via-hole wires are formed in the wiring board, the plurality of through-hole wires and the plurality of via-hole wires electrically connect an upper surface to a back surface of the wiring board, first solder pads are formed on the upper side of the wiring board, and the first solder pads are connected to the through-hole wires or the via-hole wires;

flipchip-connecting the semiconductor chip to the package board in a manner that the first solder bump on the device-forming surface of the semiconductor chip are provided opposite to the first solder pads on the upper surface of the package board;

forming second solder bumps on the plurality of pads formed on the back surface of the semiconductor chip, after the semiconductor chip is flipchip-connected to the package board;

forming a capacitor-mounted board formed of an organic substrate or a ceramic substrate, in which through-hole wires are formed in the capacitor-mounted board, the through-hole wires electrically connect an upper surface to a back surface of the capacitor-mounted board, capacitors are mounted on the capacitor-mounted board in a manner that electrodes of the capacitors are connected to printed wires connected to the through-hole wires, second solder pads connected to the through-hole wires are formed on a back surface and connected to the through-hole wires;

flipchip-connecting the capacitor-mounted board to the semiconductor chip in a manner that the second solder pads on the back surface of the capacitor-mounted board are provided opposite to the second solder bumps on the back surface of the semiconductor chip;

filling an adhesive resin between the semiconductor chip and the package substrate and between the semiconductor chip and the capacitor-mounting board, to adhere the semiconductor chip to the package substrate and the semiconductor chip to the capacitor-mounting board;

forming a resin package with molding resin on the package substrate, to cover a sidewall of the semiconductor chip, a sidewall of the capacitor-mounting board and upper surfaces of the capacitors; and

forming solder balls on the back surface of the package substrate to form a ball grid array.

6. A method of assembling a semiconductor device according to claim 5, wherein, in forming the capacitor-mounted board, the semiconductor device further comprises mounting a heat spreader on a predetermined region of the upper surface of the capacitor-mounting board via a thermal paste.

7. A semiconductor device according to claim 6, wherein, in forming the capacitor-mounted board, mounting the heat spreader on a central region of the upper surface of the capacitor-mounting board and mounting the capacitors on the upper surface of the capacitor-mounting board to surround the periphery of the heat spreader.

8. A semiconductor device comprising:

a package board formed of a wiring board, in which a plurality of through-hole wires and a plurality of via-hole wires are formed in the wiring board, the plurality of through-hole wires and the plurality of via-hole wires electrically connect an upper surface to a back surface of the wiring board, first pads and second pads are formed on the upper side of the

wiring board, and the first pads are connected to the through-hole wires and the second pads are connected to the via-hole wires;

a semiconductor chip, in which a plurality of pads including power supply pads are formed on a device-forming surface of the semiconductor chip, first bumps are formed on the plurality of pads, a plurality of through-hole wires are formed in the semiconductor chip, the plurality of through-hole wires electrically connect the device-forming surface side to a back surface side of the semiconductor chip, at least some of the power supply pads are connected to the plurality of through-hole wires, a plurality of pads are formed on the back surface and connected to the through-hole wires, second bumps are formed on the pads formed on the back surface, and the semiconductor chip is flipchip-connected to the package board in a manner that the first bumps on the device-forming surface of the semiconductor chip are provided opposite to the first pads and the second pads on the upper surface of the package board;

a capacitor-mounted board formed of an organic substrate or a ceramic substrate, in which through-hole wires are formed in the capacitor-mounted board, the through-hole wires electrically connect an upper surface to a back surface of the capacitor-mounted board, capacitors are mounted on the capacitor-mounted

board in a manner that electrodes of the capacitors are connected to printed wires connected to the through-hole wires, third pads connected to the through-hole wires are formed on a back surface of the capacitor-mounted board and connected to the through-hole wires, and the capacitor-mounted board is flipchip-connected to the semiconductor chip in a manner that the third pads on the back surface of the capacitor-mounted board are provided opposite to the second bumps on the back surface of the semiconductor chip;

an adhesive resin filled between the semiconductor chip and the package substrate and between the semiconductor chip and the capacitor-mounting board, the adhesive resin adhering the semiconductor chip to the package substrate and the semiconductor chip to the capacitor-mounting board;

a resin package formed on the package substrate, the resin package being formed of molding resin and covering a sidewall of the semiconductor chip, a sidewall of the capacitor-mounting board and upper surfaces of the capacitors; and

a ball grid array comprising a plurality of external terminal balls formed on the back surface of the package substrate, the plurality of external terminal balls being connected to the plurality of the through-hole wires or the plurality of the via-hole wires on the back surface of the package substrate.

9. A semiconductor device according to claim 8, wherein the semiconductor device further comprises a heat spreader mounted on a predetermined region of the upper surface of the capacitor-mounting board via a thermal paste.

10. A semiconductor device according to claim 9, wherein the heat spreader is mounted on a central region of the upper surface of the capacitor-mounting board and the capacitors are mounted on the upper surface of the capacitor-mounting board to surround the periphery of the heat spreader.

11. A semiconductor device according to claim 8, wherein sizes of the semiconductor chip and the capacitor-mounting board are smaller than a size of the package board, and a sidewall of the mold resin covering sidewalls of the semiconductor chip and the capacitor-mounting board is substantially aligned with a side wall of the package board.

12. A method of assembling a semiconductor device comprising:

forming a semiconductor chip, in which a plurality of pads including power supply pads are formed on a device-forming surface of the semiconductor chip, a plurality of through-hole wires are formed in the semiconductor chip, the plurality of through-hole wires extend from the device-forming surface to a back surface of the semiconductor chip, at least some of the

power supply pads are connected to the plurality of through-hole wires, a plurality of pads are formed on the back surface and connected to the through-hole wires, first solder bumps are formed on the pads formed on the back surface;

forming a package board formed of a wiring board, in which a plurality of through-hole wires and a plurality of via-hole wires are formed in the wiring board, the plurality of through-hole wires electrically connect an upper surface to a back surface of the wiring board, the plurality of via-hole wires electrically connect an upper surface to a back surface of the wiring board, first solder pads and second solder pads are formed on the upper side of the wiring board, the first solder pads are connected to the through-hole wires; and the second solder pads are connected to the via-hole wires;

flipchip-connecting the semiconductor chip to the package board in a manner that the first bump on the device-forming surface of the semiconductor chip are provided opposite to the first solder pads and the second solder pads on the upper surface of the package board;

forming second solder bumps on the plurality of pads formed on the back surface of the semiconductor chip, after the semiconductor chip is flipchip-connected to the package board;

forming a capacitor-mounted board formed of an organic substrate or a ceramic substrate, in which through-hole wires are formed in the capacitor-mounted board, the through-hole wires electrically connect an upper surface to a back surface of the capacitor-mounted board, capacitors are mounted on the capacitor-mounted board in a manner that electrodes of the capacitors are connected to printed wires connected to the through-hole wires, third pads connected to the through-hole wires are formed on a back surface and connected to the through-hole wires;

flipchip-connecting the capacitor-mounted board to the semiconductor chip in a manner that the third pads on the back surface of the capacitor-mounted board are provided opposite to the second solder bumps on the back surface of the semiconductor chip;

filling an adhesive resin between the semiconductor chip and the package substrate and between the semiconductor chip and the capacitor-mounting board, to adhere the semiconductor chip to the package substrate and the semiconductor chip to the capacitor-mounting board;

forming a resin package with molding resin on the package substrate, to cover a sidewall of the semiconductor chip, a sidewall of the capacitor-mounting board and upper surfaces of the capacitors; and

forming solder balls on the back surface of

the package substrate to form a ball grid array.

13. A method of assembling a semiconductor device according to claim 12, wherein, in forming the capacitor-mounted board, the semiconductor device further comprises mounting a heat spreader on a predetermined region of the upper surface of the capacitor-mounting board via a thermal paste.

14. A semiconductor device according to claim 13, wherein, in forming the capacitor-mounted board, mounting the heat spreader on a central region of the upper surface of the capacitor-mounting board and mounting the capacitors on the upper surface of the capacitor-mounting board to surround the periphery of the heat spreader.

15. A semiconductor device according to claim 2, wherein a height of the heat spreader mounted on the upper surface of the capacitor-mounting board is higher than a height of the capacitors.

16. A method of assembling a semiconductor device according to claim 6, wherein a height of the heat spreader mounted on the upper surface of the capacitor-mounting board is higher than a height of the capacitors.

17. A semiconductor device according to claim 9, wherein a height of the heat spreader mounted on the upper surface of the capacitor-mounting board is higher than a height of the capacitors.

18. A method of assembling a semiconductor device according to claim 13, wherein a height of the heat spreader mounted on the upper surface of the capacitor-mounting board is higher than a height of the capacitors.